

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
5 a gate insulating film adjacent to said semiconductor layer;  
a gate electrode adjacent to said gate insulating film;  
a first insulating film formed over said insulating surface, said semiconductor layer, said gate insulating film and said gate electrode;  
10 a second insulating film comprising an organic resin formed on said first insulating film;  
an electrode formed on said second insulating film and connected to one of said first and second impurity regions; and  
a pixel electrode formed on said second insulating film.

2. A semiconductor device of claim 1 wherein said semiconductor layer  
15 comprises crystalline silicon.

Sub 2) 3. A semiconductor device of claim 1 wherein said first insulating film  
comprises silicon oxide.

4. A semiconductor device of claim 1 wherein said second insulating  
film comprises polyimide.

20 5. A semiconductor device of claim 1 wherein said electrode has a laminate structure including a first conductive film comprising aluminum and a second conductive film comprising titanium nitride.

6. A semiconductor device of claim 1 wherein said pixel electrode is electrically connected to one of said first and second impurity regions.

7. A semiconductor device of claim 1 wherein a portion of said pixel electrode is under said electrode.

8. A semiconductor device comprising:

- 5 a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film formed on said semiconductor layer;  
a gate electrode formed on said gate insulating film;  
a first insulating film formed over said insulating surface, said  
10 semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said first insulating film;  
an electrode formed on said second insulating film and connected to one of said first and second impurity regions; and  
15 a pixel electrode formed on said second insulating film.

9. A semiconductor device of claim 8 wherein said semiconductor layer comprises crystalline silicon.

Sub C4 10. A semiconductor device of claim 8 wherein said first insulating film comprises silicon oxide.

20 11. A semiconductor device of claim 8 wherein said second insulating film comprises polyimide.

12. A semiconductor device of claim 8 wherein said electrode has a laminate structure including a first conductive film comprising aluminum and a second conductive film comprising titanium nitride.

13. A semiconductor device of claim 8 wherein said pixel electrode is electrically connected to one of said first and second impurity regions.

14. A semiconductor device of claim 8 wherein a portion of said pixel electrode is under said electrode.

5  
10  
15  
Sub. A4 cont.

15. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film adjacent to said semiconductor layer;  
a gate electrode adjacent to said gate insulating film;  
a first insulating film formed over said insulating surface, said semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said first insulating film;  
an electrode formed on said second insulating film and connected to one of said first and second impurity regions; and  
a transparent pixel electrode formed on said second insulating film.

16. A semiconductor device of claim 15 wherein said semiconductor layer comprises crystalline silicon.

20  
Sub C6

17. A semiconductor device of claim 15 wherein said first insulating film comprises silicon oxide.

18. A semiconductor device of claim 15 wherein said second insulating film comprises polyimide.

19. A semiconductor device of claim 15 wherein said electrode has a laminate structure including a first conductive film comprising aluminum and a second conductive film comprising titanium nitride.

5 20. A semiconductor device of claim 15 wherein said pixel electrode is electrically connected to one of said first and second impurity regions.

21. A semiconductor device of claim 15 wherein a portion of said pixel electrode is under said electrode.

22. A semiconductor device of claim 15 wherein said transparent pixel electrode comprises indium tin oxide.

10 23. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film formed on said semiconductor layer;  
a gate electrode formed on said gate insulating film;  
15 a first insulating film formed over said insulating surface, said semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said first insulating film;  
an electrode formed on said second insulating film and connected to  
20 one of said first and second impurity regions; and  
a transparent pixel electrode formed on said second insulating film

24. A semiconductor device of claim 23 wherein said semiconductor layer comprises crystalline silicon.

Sub C8

25. A semiconductor device of claim 23 wherein said first insulating film comprises silicon oxide.

26. A semiconductor device of claim 23 wherein said second insulating film comprises polyimide.

5 27. A semiconductor device of claim 23 wherein said electrode has a laminate structure including a first conductive film comprising aluminum and a second conductive film comprising titanium nitride.

28. A semiconductor device of claim 23 wherein said pixel electrode is electrically connected to one of said first and second impurity regions.

10 29. A semiconductor device of claim 23 wherein a portion of said pixel electrode is under said electrode.

30. A semiconductor device of claim 23 wherein said transparent electrode comprises indium tin oxide.

15 31. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film adjacent to said semiconductor layer;  
a gate electrode adjacent to said gate insulating film;  
20 a first insulating film formed over said insulating surface, said semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said first insulating film;  
an electrode formed on said second insulating film and connected to  
25 one of said first and second impurity regions wherein said electrode has a laminate

structure including a first conductive film comprising aluminum and a second conductive film comprising a different material from said first conductive film;

a pixel electrode formed on said second insulating film and electrically connected to said one of said first and second impurity regions through said electrode wherein said second conductive film is interposed between said pixel electrode and said first conductive film; and

a conductive layer formed on said second insulating film and connected to the other one of said first and second impurity regions.

10 32. A semiconductor device of claim 31 wherein said semiconductor layer comprises crystalline silicon.

Sub C14 33. A semiconductor device of claim 31 wherein said first insulating film comprises silicon oxide.

34. A semiconductor device of claim 31 wherein said second insulating film comprises polyimide.

15 35. A semiconductor device of claim 31 wherein said second conductive film comprises titanium nitride.

Sub A8 36. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film adjacent to said semiconductor layer;  
a gate electrode adjacent to said gate insulating film;  
a first insulating film formed over said insulating surface, said semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said first insulating film;

20  
25

an electrode formed on said second insulating film and connected to one of said first and second impurity regions wherein said electrode has a laminate structure including a first conductive film comprising aluminum and a second conductive film comprising a different material from said first conductive film;

a transparent pixel electrode formed on said second insulating film and electrically connected to said one of said first and second impurity regions through said electrode wherein said second conductive film is interposed between said pixel electrode and said first conductive film; and

a conductive layer formed on said second insulating film and connected to the other one of said first and second impurity regions.

37. A semiconductor device of claim 36 wherein said semiconductor layer comprises crystalline silicon.

38. A semiconductor device of claim 36 wherein said first insulating film comprises silicon oxide.

39. A semiconductor device of claim 36 wherein said second insulating film comprises polyimide.

40. A semiconductor device of claim 36 wherein said second conductive film comprises titanium nitride.

41. A semiconductor device of claim 36 wherein said transparent pixel electrode comprises indium tin oxide.

42. A semiconductor device comprising:  
a semiconductor layer having at least first and second impurity regions and a channel formation region formed on an insulating surface;  
a gate insulating film adjacent to said semiconductor layer;

a gate electrode adjacent to said gate insulating film;  
a first insulating film formed over said insulating surface, said  
semiconductor layer, said gate insulating film and said gate electrode;  
a second insulating film comprising an organic resin formed on said  
5 first insulating film;

an electrode formed on said second insulating film and connected to  
one of said first and second impurity regions wherein said electrode has a laminate  
structure including a first conductive film comprising aluminum and a second  
conductive film comprising a different material from said first conductive film;

10 a transparent pixel electrode formed on said second insulating film  
and electrically connected to said one of said first and second impurity regions  
through said electrode wherein said second conductive film is in direct contact with  
said one of the impurity regions and said transparent pixel electrode and said first  
conductive film is formed on said second conductive film; and

15 a conductive layer formed on said second insulating film and  
connected to the other one of said first and second impurity regions, wherein said  
electrode comprises a same material as said conductive layer.

43. A semiconductor device of claim 42 wherein said semiconductor  
layer comprises crystalline silicon.

Sub 20C14 44. A semiconductor device of claim 42 wherein said first insulating film  
comprises silicon oxide.

45. A semiconductor device of claim 42 wherein said second insulating  
film comprises polyimide.

25 46. A semiconductor device of claim 42 wherein said second conductive  
film comprises titanium nitride.



Add  
A<sub>10</sub>

[illegible]